



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/026,637	12/27/2001	Fumio Koyama	111587	7748
25944	7590	04/29/2004	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			RODRIGUEZ, ARMANDO	
			ART UNIT	PAPER NUMBER
			2828	

DATE MAILED: 04/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/026,637	KOYAMA ET AL.
	Examiner Armando Rodriguez	Art Unit 2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 08 January 2004.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 1-26 is/are pending in the application.  
 4a) Of the above claim(s) 11,12 and 24-26 is/are withdrawn from consideration.  
 5) Claim(s) 16-23 is/are allowed.  
 6) Claim(s) 1-10 and 13-15 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
     1. Certified copies of the priority documents have been received.  
     2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
     3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
     \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. <u>4-26-2004</u> .
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.	6) <input type="checkbox"/> Other: _____.

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election of group I, claims 1-10 and 13-23, with traverse filed on July 18, 2003 is acknowledged.

Applicant's arguments filed on January 8, 2004, regarding the finality of the restriction requirement as being improper based on new grounds of restriction is acknowledged and the finality is withdrawn.

Applicant's arguments filed on January 8, 2004 requesting an explanation of the new grounds of the restriction pertaining to the method of claims 11 and 12 requiring a step that is not required in the device claims. The method claims require the formation of a post, which are known in the art to provide a current path. The device as claimed does not require the formation of the post and can be made by a different method, such as providing semi-insulating regions by ion implantation within the upper reflector to define a current aperture, thereby forming two laser devices having different structures.

### ***Response to Arguments***

Applicant's arguments, see pages 1-3, filed January 8, 2004, with respect to claims 1-10 and 13-23 have been fully considered and are persuasive. The 35 USC 112 second paragraph rejection of claims 1-10 and 13-23 has been withdrawn.

### ***Response to Amendment***

Claims 1-26 are pending, the restriction of claims 11,12 will be maintained and newly added claims 24-26 will be grouped with the restricted claims. Claims 1-10 and 13-23 will be examined.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 recites the limitation "the media" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 13 recites the limitation "the light emitting surfaces" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim 13, applicant has implied plural light emitting surfaces but has only defined a light emitting spot in claim 1, there is no recited claim language for obtaining a plurality of emitting surfaces.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1,6-9,13 are rejected under 35 U.S.C. 102(e) as being anticipated by Ostergaard et al (PN 6,683,898).

Ostergaard et al discloses in column 3 lines 1-13, 50-65 and the abstract a vertical cavity surface emitting laser (VCSEL), which provides improved laser efficiency by suppressing certain modes without losses.

Regarding claims 1,7,13

Figure 1A illustrates a VCSEL having a bottom mirror (102), an active layer (104) and a top mirror (105). Top mirror includes a photonic bandgap region (PBG) (115) [applicant's boundary region] with scattering centers (116) [applicant's divided region], where the region (115) delimits an aperture (118) [applicant's light emitting region], as described in column 8 lines 30-64 region (115) provides mode suppression.

Regarding claim 6,

Figure 1A illustrates aperture (118) large enough to provide light emission.

Regarding claim 8,

Figure 5 illustrates additionally providing a current aperture formed by oxidized region (107).

Regarding claim 9,

Column 4 line 61 to column 5 line 2, discloses polarization of the modes.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-5,10,14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ostergaard et al (PN 6,683,898) and Shieh et al (PN 5,293,392).

Regarding claims 2-5,14 and 15

Figures 8A-8D and 15A-15B illustrate different forms, locations and shapes of the PBG region [applicant's boundary region] for providing mode suppression. Column 11,12 and 14 describe the PBG region as rods, holes, pads and trenches.

Therefore, the different forms of applicant's boundary region as in claims 2-5,14 and 15 would have been an obvious design preference, as suggested and implied by Ostergaard, since none of the particular forms modify the operation of the VCSEL. See *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1996).

Regarding claim 10,

The use of etch stop layer in VCSEL is well known in the art, as disclosed by Shieh et al in column 2 and in the abstract, where an etch stop layer (20) is positioned on the top mirror.

#### ***Allowable Subject Matter***

Claims 16-23 are allowed.

The following is an examiner's statement of reasons for allowance:

None of the cited prior arts alone or in combination discloses the claimed semiconductor laser having the recited limitations of independent claim 16, for suppressing undesired modes and providing a plurality of emitting light surfaces in phase.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

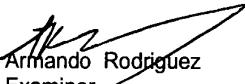
Claim 10 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Armando Rodriguez whose telephone number is 571-272-1952. The examiner can normally be reached on flex / M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on 571-272-1834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Armando Rodriguez  
Examiner  
Art Unit 2828

AR/DW

  
Don Wong  
Supervisor  
Art Unit 2828